

Garden Pea

Botanical Name:

Pisum sativum L.

Family:

Fabaceae

Chromosome number

2n=14

Origin :

*Central Asia, the near East,
Abyssinia and the Mediterranean*

Uses

- ☐ **Highly nutritive containing high %age of digestible protein (very valuable for the vegetarians) alongwith carbohydrates and vitamins A and C.**
- ☐ **It is also very rich in minerals Ca and P.**
- ☐ **Excellent food for human consumption taken either as a vegetable or in soup.**
- ☐ **Large proportion is processed (canned, frozen or dehydrated) for consumption in the off-season.**
- ☐ **Being N fixing legume, recognized as a soil building crop on account of its value as a green manure crop.**
- ☐ **Pea is being used in a growing snack market.**

Soils

- ♠ Grown on all kinds of soils but the best crop can be taken from well drained and fertile loam soil.
- ♠ Light soils are good for early crop whereas heavy soils are found suitable for main crop and produce high yield.
- ♠ The soil pH 6-7.5 is the best for its proper growth and development.

Climate

- ⇒ A cool season crop and requires frost free weather particularly at flowering and pod formation stage though vegetative growth is not affected by the frost
- ⇒ The optimum temperature for better growth and yield is 13-19°C.
- ⇒ High temperature reduces the pod quality as sugars in the seeds changes to hemicellulose and starch.

Cultivars are grouped on the basis of various characters

a) According to seed

1. Round or smooth seeded cultivars
2. Wrinkled seeded cultivars.

a) According to height of plant

1. Bush or dwarf types
2. Medium tall types.
3. Tall types.

a) According to maturity period

1. Early – 65-80 days
2. Medium – 90-100 days.
3. Main season – 110-120 days.

a) According to use of pods

1. Fresh market types
2. Freezing types.
3. Canning types.
4. Dehydration types

Some important cultivated varieties

Early Wrinkle seeded

Arkel

Matar Ageta 6

Azad P3

Pant Matar 2 (PM-2)

VL Ageti Matar 7 (VL-7)

Early Badger

Little Marvel

Kelvendon Wonder

Early December

Jawahar Matar 3 & 4

Edible poded

Sylvia, Punjab Mithi Phali

Alaska, Early Superb, Meteor

Early Smooth Seeded

Asauji

Lucknow Boniya

Alaska

Early Superb

Meteor

Main season wrinkle seeded

Bonneville

Lincoln

Azad P-1

PB-89

Palam Priya

VL-3



Azad P-1



Lincoln



Palam Priya



Edible poded



Palam Sumool



Pb-89



Punjab-89 A high yielding variety having desirable horticultural traits and field tolerance to powdery mildew

Cultivars suitable for growing in Himachal Pradesh

Early Varieties

Arkel

Matar Ageta 6

VL Ageti Matar 7 (VL-7)

Main Varieties

Punjab-89

Palam Priya

Lincoln

Bonneville

Azad P1

VL-3

Kinnauri

Solan Nirog

Punjab Round

Sowing Time

Area	Early varieties	Main season varieties
North India	September	First fortnight of October – end November
Peninsular India	June- July	Adverse effect when sown after November

Sowing Time for H.P.

Zone	Early varieties	Main season varieties
Low Hills	September - October	November
Mid Hills	September (first fortnight)	Late October- November
High Hills	March -June	October- November, March - June

Seed Rate

Early varieties	120-130
Main season varieties	75-100

Depth of sowing

5-7.5 cm

Spacing

Early varieties	30cm X 5cm
Main season varieties	45-60cm X 10cm

Seed inoculation

- 😊 Inoculation of seed with *Rhizobium* culture can be used.
- 😊 The culture material is emulsified in 10% sugar or jaggery solution sufficient to moist the seed.
- 😊 Mix thoroughly with seed and dried in shade before sowing.
- 😊 Seed inoculation helps in quick nodulation on the roots which in turn fix atmospheric nitrogen.

Seed treatment

- 😊 The seeds may be treated with fungicides like thiram or captan (3g/kg of seed) or bavistine (2.5g/kg of seed) to save the crop against wilt.
- 😊 If both seed inoculation and fungicide treatments are to be given, then firstly the seeds are treated with fungicide followed by inoculation with *Rhizobium* culture.

Manures and Fertilizers

Open pollinated varieties

Farmyard manure (q/ha)	N	P ₂ O ₅	K ₂ O
	(Kg/ha)		

- ☺ Full dose of farmyard manure and phosphorus, potassium and N should be applied at the time of sowing.
- ☺ Less responsive to fertilizer than most vegetables.
- ☺ Short growing season and the ability to fix atmospheric N, and residual N from fertilizers and decomposition of soil organic matter
- ☺ Sensitive to excess salts during germination and fertilizer should not come in direct contact with the seed.

Interculture and weed control

sowing and second at flowering initiation to get higher yield.

- ▶ Hoeing helps in removing the weeds and pulverizes the soil for proper aeration.
- ▶ Root injury should be avoided during the operation.
- ▶ Hoeing should be followed by earthing up to strengthen the plants and to encourage the root growth.
- ▶ Herbicides have also been found beneficial in controlling weeds.
- ▶ Pre-emergence application of Alachlor 3litres/ha or Pendimethalin @ 3litres/ha or Fluchloralin @ 2.5 litres/ha may take care of weeds.
- ▶ In case of severe infestation, one or two weeding may be done to ensure weed free crop.

Irrigation

- || Water requirement of crop depends largely on agro-climatic conditions of the locality.
- || Pea seed can tolerate dehydration in initial stage of imbibitions but once the seeds begin metabolic activity, dehydration causes damage to cotyledons and embryo.
- || In general, one pre-sown irrigation is essential for proper germination.
- || One irrigation before and one during flowering and another at pod formation stage are important to obtain quality and good yield.
- || Possible to grow under rainfed conditions but sufficient moisture must be present in the field at the time of sowing.

Harvesting

- ❑ The peas are harvested when the pods are fully green and well developed.
- ❑ The seeds should be near full size and should not have begun to harden.
- ❑ The high quality of pea is associated with tenderness and high sugar content.
- ❑ During maturity, sugar contents decreases rapidly and there is an increase in starch and other polysaccharides and insoluble nitrogenous components such as protein.
- ❑ Calcium migrates to seed coat and toughness of skin increases during ripening.
- ❑ Picking should be done as soon as green ovules are fully developed and pods still not over mature.
- ❑ Early varieties give 2-3 pickings while 3-4 pickings at 7-10 days interval are taken from main season.
- ❑ Picking should be done either early in the morning or late in the afternoon.
- ❑ Picking during mid day deteriorates the quality of pea by heat.

Yield (q/ha)

Early varieties

60-85

Main season varieties

100-150

Heat Units

- A heat unit system is used in commercial pea production to predict relative maturity dates and to schedule planting dates.
- This system uses 40°F as the threshold temperature or base temperature & 85°F as the maximum temperature.
- The daily heat units accumulating during the development of a cultivar are calculated from the daily temperature mean.
- Heat units accumulate slowly during the cool spring & rapidly as the season progresses.
- With this information, the expected time of maturity of a cultivar can be determined from the mean temperature of the few seasons.
- For early cultivar – 1534 heat units whereas for late cultivars 3942 heat units are required.
- The edible types are picked when pods have reached full length and seeds are just developing.

Post Harvest Handling

- 😊 **Rapid handling & removal of field heat are essential to prevent loss of quality after harvesting especially during periods of high temperature.**
- 😊 **Green peas loose much of their sugar content unless they are promptly cooled to 32 °F.**
- 😊 **Hydrocooling is the preferred method for precooling.**
- 😊 **At 32 °F & 95-98% RH, green peas can be stored for 1-2 weeks.**
- 😊 **If the crop is packed with crushed ice, storage may be extended for 1 additional week.**
- 😊 **2 weeks in cold storage at 0 °C & 85-95 % RH.**
- 😊 **Temperature at 21.5 °C become unfit for sale at the end of 5 days.**

Diseases

1. Powdery mildew (*Erysiphe polygoni*)

Karathane, Dikar (Monocap), Sulfex

2. Fusarium wilt (*F.oxysporum f.pisi*)

Seed treatment with bavistine, soil drenching, long crop rotation

3. Root rots (*Rhizocotonia*, *Fusarium*, *Pythium*)

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4. Bacterial blight

- ✓ Slurry treatment of seed with streptomycine sulphate (2.5 g/kg of seed)
- ✓ Soaking seeds in streptomycine solution for 2 hours

5. Viral diseases

Spread by aphids

Powdery mildew



Bacterial blight



***Fusarium* wilt**

Insect-pests

Insect	Control measure
Pea aphid	Spray malathion(0.05%)/oxy demeton methyl(0.025%)
Pod borer	Spray carbaryl 0.1%
Pea Weevil	Fumigation of dry peas with methyl bromide
Leaf minor	Spray methy demeton(0.025%)or cypermethrin(0.0075%)

Sugar snap peas

- A type of edible poded pea or snow pea developed from a cross of a standard pea with a mutant.
- These are very crisp, sweet, tender pod pea that can be eaten raw as well as cooked.
- Sugar snaps are characterized by slow development of seeds and pod fibre.
- It tastes like sweet young peas and like tender, sweet edible poded peas.
- These are more difficult to grow than standard peas because
 - ❖ Sensitive to adverse environment conditions
 - ❖ Very susceptible to powdery mildew
 - ❖ Sensitive to over ripeness, losing market quality rapidly and must be harvested with in 12-24 hours of maturity
- The crop is harvested before the seed enlarges and the pod become fibrous.

Sugar Snaps





INTEGRATED OUTLOOKING OF HORTICULTURE
AND HONEYBEE'S
PROJECT TITLE
PRODUCTION OF QUALITY SEED OF BANDED PEA &
FRENCHBEAN FOR THE BENEFIT OF VEGETABLE
GROWERS OF HIMACHAL PRADESH
DATE OF START : JUNE 4 2004
DURATION : 3 YEARS
TOTAL BIDDY OUTLAY: Rs. 13.72 LAKHS

Thanks



Broad Bean

Botanical description

Scientific Name	:	<i>Vicia faba</i> L.
Chromosome Number	:	2n=12, 14
Family	:	Fabaceae
Centre of Origin	:	North Africa or South Caspian Sea.

Nutritive value: (per 100 g of edible portion)

Energy	48kcal
Moisture	85.4g
Protein	4.5g
Fat	0.1g
Carbohydrate	7.2g
Vit-A	15IU
Thiamin	0.08mg
Niacin	0.8mg
Ascorbic acid	12mg
Calcium	50mg
Phosphorus	64mg
Iron	1.4mg

- **Broad bean** (*Vicia faba* L.) also known as faba bean or horse bean.
- It is a minor leguminous crop grown in localized areas in India but is an important food crop of South America.
- It is the only bean grown as a winter crop.
- Broad beans are used as green, shelled and dry beans and as a feed for livestock.

Climatic Requirements

- Broad bean is a hardy plant.
- It is grown mainly at higher altitudes where the climate is relatively cool.
- It is the only bean, which can withstand cold (up to 4°C), therefore, it is grown as winter crop.

Soil conditions

- It prefers rich, well drained loamy soil with pH range of 6.5 to 7.5.
- Acidic soils are not good for broad bean.
- It can tolerate salinity up- to some extent.
- Land should be prepared thoroughly by giving repeated ploughing to get fine tilth.

Varieties

- **Long pod type:-** Aquadule Claudin, Imperial White Long pod, Masterprice Green Long Pod, Imperial Green Long pod, Red epicure .
- **Windsor Type:-** Imperial White Windsor, Giant four seeded green Windsor, Imperial Green Windsor

Indian Varieties

- **Pusa Sumeet:** Plants are 75cm tall having on an average of 10 branch/plant. A plant bears about 100 pods. The pod length and thickness are 6.0cm and 1.3cm respectively. It has attractive dark green pods and borne in cluster. The average yield potential is 180q/ha.
- , “Selection BR-1”
- “SelectionBR-2” are black and yellow seeded varieties respectively developed from Bihar state.
- **Jawahar Viva 73-81’** is a dormant type, reported from Madhya Pradesh.

Seed Rate : 70 - 100 kg/ha

- **Sowing** is done in the month of September-October and February-March.
- Seeds are sown in shallow furrows of 15 cm width formed at a spacing of 75 cm.
- Each furrow two rows of seeds are sown at a spacing of 25cm in a zigzag manner along the furrows.
- It can be sown in a single row system with spacing of 45x15 cm

Manuring

FYM - 10 tonnes/ha

N - 25 kg/ha

P - 50 kg/ha

K - 40 kg/ha

Use of PGR

Certain plant regulators like PCPA @ 2ppm, alpha-naphthyl acetamide @ 2-25ppm or beta-naphthoxy acetic acid @ 5-25ppm. When normally pods do not set, induce fruit set. Thus by spraying some plant regulators, higher, early and total yield can be obtained.

Irrigation and cultural practices

- Immediately after sowing, the field has to be irrigated.
- This is followed by light irrigation on the third day. Thereafter, light irrigation should be given at a regular interval of 12-15days.
- Regular intercultural operations should be carried out by hand weeding and hoeing to keep the weeds under check and to provide a good environment for crop growth.

- Tall varieties may be given support with wooden sticks or twigs against wind.
- Place stakes or canes at one meter interval on both sides of the double rows close to the beans.
- Then tie around the stakes with twine 30cm to 60cm above the ground.

Harvesting and Yield

- The pods are ready for harvesting in 3-4 months for spring sowing and 6-7 months for autumn sowing.
- Very young pods are preferred by most people.
- The beans are harvested at the green-shell stage as needed for home use or for market and those remaining on the plant are used as dry-shell beans.
- Pod yield of 7-10 tonnes/ha
- Green bean yield of 1.8-2 tonnes /ha is expected

Plant Protection

Insect Pests

Stem flies, thrips and mites are some of the insect pests attacking bean crop. Spraying 2ml/litre of Dimethoate (Rogor) or Monocrotophos for the control of thrips and stem fly. Mites can be controlled by spraying Dicofol (kelthane) 2.5ml/litre.

Diseases

1. Yellow mosaic, anthracnose, Phytophthora pod rot, rust, angular leaf spot, ashy stem blight and rhizoctonia root rot are some of the diseases affecting bean crop.
2. The diseases can be effectively controlled by spraying Blitox or Difoliton at the rate of 2kg/litre.
3. Root rot can be controlled by drenching captan 2g/litre.

4. Foliar fungal diseases can be controlled by spraying Dithane M-45
5. Yellow mosaic vector white fly can be controlled by spraying Monocrotophos 1.25ml/litre.
6. Rust can be controlled by spraying sulfex 2g/litre.

Thanks